RODE, T.V.; GOL'DER, G.A.; ZACHATSKAYA, A.V.

Interaction of sodium peroxide and sodium superoxide with sodium bicarbonate. Zhur. neorg. khim. 5 no.3:535-539 Mr'60. (MIRA 14:6)

(Sodium peroxide)
(Sodium superoxide)
(Sodium carbonate)

29984

S/076/61/035/011/004/013
B140/B147

15.2660

AUTHORS: Rode, T. V., and Rode, V. Ye.

TITLE: A study of the magnetic properties of ferromagnetic chromium oxides

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 11, 1961, 2475 - 2479

TEXT: T. V. Rode (Author's abstract of the dissertation, IONKh AN SSSR, 1956) found that not only one, but two structurally different ferromagnetic chromium oxides occur in the system CrO_3 - Cr_2O_3. A detailed study showed the existence of 4 intermediate chromium oxides: Deca-, di-, and monochromate, and one of the general formula CrO_2. CrO_2 has a rutile-type crystal lattice with tri- and hexavalent chromium. It is only formed by thermal decomposition of chromic anhydride or chromium chromate in an autoclave under increased O_2 pressure. Not only CrO_2 but also $Cr_2(CrO_4)_3$ exhibited ferromagnetic properties. The authors studied the magnetic properties of these compounds. The intensity of magnetization was determined

Card 1/

29984
S/076/61/035/011/004/013
B140/B147

A study of the magnetic properties ...

by the Faraday method. The Curie points of $Cr_2(CrO_4)_3$ and CrO_2 were found at 80°C and 105°C, respectively, from the temperature dependence of the magnetic susceptibility of these substances. This confirms the existence of two chromium oxides of different chemical structure. It was found that the magnetism of $Cr_2(CrO_4)_3$ is not due to the presence of CrO_2. Thermographic and X-ray analysis showed that the amount of CrO_2 contained in the $Cr_2(CrO_4)_3$ is not sufficient to cause the ferromagnetism observed. The magnetic properties of the samples varied with the methods applied for their preparation. Fig.3 represents the magnetization curves as a function of the magnetizing field, and Fig.4 the magnetic saturation as a function of the chemical composition. The course of the latter curve might be due to an uncompensated antiferromagnetism. There are 4 figures, 1 table and 25 references: 5 Soviet and 20 non-Soviet. The three most recent references to English-language publications read as follows: R. Schwarz, I. Fankuchen, R. Ward, J. Amer. Chem. Soc., 74, 1676, 195[illegible]; I. Volger, Nature, 170, 1027, 1952; B. Brockhause, J. Chem. Phys., 21, 961,

Card 2/4

A study of the magnetic properties ...

1955.

ASSOCIATION: Akademiya nauk SSSR institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Academy of Sciences USSR, Institute of General and Inorganic Chemistry im. N. S. Kurnakov) (Moscow State University imeni M.V.Lomonosov)

Fig. 3. Magnetization curves as a function of the field strength for calcinated samples. (1) (2) $CrO_{2.4}$; (3) $CrO_{2.40}$; (4) $CrO_{2.30}$; (5) $CrO_{2.20}$ (6) $CrO_{1.95}$; (7) $CrO_{1.56}$; (8) $CrO_{1.83}$, obtained by 3 hr calcination of $Cr(OH)_3$ at 325°C in a stream of oxygen; (9) $Cr_2(CrO_4)_3$, obtained by 1 hr calcination of CrO_3 at 390°C. Legend: (a) kilooersted.

Fig. 4. Curve of the magnetic saturation as a function of composition in the range $CrO_{2.40}$ - $CrO_{1.56}$. Legend: (a) atoms O per atom Cr; (b) saturation magnetization in gauss.

Card 3/4

RODE, Tat'yana Vladimirovna; BALANDIN, A.A., akademik, otv. red.; DRAGUNOV, E.S., red. izd-va; KASHINA, P.S., tekhn. red.; DOROKHINA, I.N., tekhn. red.

[Oxygen compounds of chromium and chromium catalysts] Kislorodnye soedineniia khroma i khromovye katalizatory. Moskva, Izd-vo Akad. nauk SSSR, 1962. 278 p. (MIRA 15:3)
(Catalysts, Chromium)

RODE, T.V.; RODE, B.Ye. (Moscow)

Magnetic properties of ferromagnetic chromium oxides. Zhur. fiz.khim. 35 no.11:2475-2480 N '61. (MIRA 14:12)

1. Akademiya nauk SSSR, Institut obshchey i neorganicheskoy khimii imeni N.S. Kurnakova i Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

(Chromium oxide--Magnetic properties)

PHASE I BOOK EXPLOITATION SOV/5991

Rode, Tat'yana Vladimirovna

Kislorodnyye soyedineniya khroma i khromovyye katalizatory (Oxygen Compounds of Chromium and Chromic Catalysts) Moscow, Izd-vo AN SSSR, 1962. 278 p. Errata slip inserted. 3000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova.

Resp. Ed.: A. A. Balandin, Academician; Ed. of Publishing House: E. S. Dragunov; Tech. Eds.: P.S. Kashina and I. N. Dorokhina.

PURPOSE: This book is intended for research and industrial chemists interested in catalysts.

COVERAGE: The monograph reviews the available material on the chemistry of chromium oxides and their catalytic properties, summarizing Soviet and non-Soviet data and the experimental results of the author's research. The results of the thermographic investiga-

Card 1/4

tion of catalysts, an original method with the author, are included. Other innovational aspects of the work are the investigation of phase transformations occurring in Cr catalysts during various conditions of preparation; a new combination of experimental methods for determining the effects of various factors (temperature, time, pressure, impurities, aging, etc.) on the catalytic properties of Cr catalysts; and methods for establishing a number of properties which accompany catalytic activity. The nature of unstable phases formed during the thermal treatment of chromium anhydride has also been explained. Thermographic investigation of the poisoning and regeneration of catalysts is considered "extremely prospective". Experimental data obtained by the author are of practical importance in that they form the scientific basis for processes of manufacturing chromium catalysts. The author thanks A. A. Balandin, I. D. Rozhdestvenskaya, G. A. Gol'der, and Professor Ye.Ya. Rode. There are 460 references: 292 Soviet, 136 English, 29 German, and 3 French.

RODE, T.V.; KAZANSKIY, V.B.; PECHERSKAYA, Yu.I. (Moscow)

Electron magnetic resonance study of chromium oxides. Zhur.fiz.-khim. 35 no.10:2370-2375 O '61. (MIRA 14:11)

1. Akademiya nauk SSR, Institut obshchey i neorganicheskoy khimii imeni N.S.Kurnakova.

(Chromium oxide--Spectra)

SHMAKOV, M.I., inzh.; RODE, V.K., inzh.

Using an excavator in exploring strip mines for concrete aggregates. Gidr. stroi. 32 no.1:42-43 Ja '62. (MIRA 15:3)
(Excavating machinery) (Aggregates (Building materials))

15 8150
11.2205

25340
S/020/61/138/006/016/019
B103/B215

AUTHORS: Terent'yev, A. P., Corresponding Member AS USSR, Rode, V. V., Rukhadze, Ye. G., and Filatov, E. S.

TITLE: Determination of the molecular weight of chelate polymers

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 138, no. 6, 1961, 1361-1364

TEXT: The determination of the molecular weights of chelate polymers is difficult since they generally are solid, nonfusible, and insoluble substances (C. S. Marvell, N. Tarkoy, Ref. 1: J. Am. Chem. Soc., 79,6000 (1957)). V. V. Korshak and assistants (Ref.2: Vysokomolek. soyed. 1,1764 (1959), Ref. 3: ibid. 2 492 (1960), Ref.4: ibid. 498 (1960), Ref.4, ibid. 662 (1960)) assume that the molecular weight of metal polymers with different bis β-diketones is not higher than 8000 - 10,000. It is known that chelate polymers contain three kinds of end groups in the molecule: $HLgn\left[M-Lgn\right]_n M-LgnH$ (1); $HLgn\left[M-Lgn\right]_n M-A$ (2); and $A\left[M-Lgn\right]_n M-A$ (3), where H is a hydrogen atom, H_2Lgn is a molecule

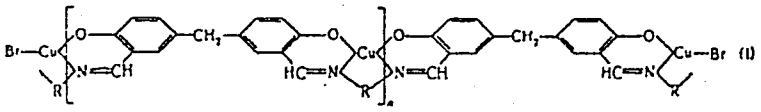
Card 1/2

Determination of the molecular ...

of the ligand containing 4 (and more) donor atoms, M is the ion of a bivalent metal, and A a monovalent anion. According to the conditions of polycondensation, polychelates with different end groups can be produced. An excess of metal salt causes the formation of anion groups at the ends of macromolecules. For case (3), the number of these groups (in %) is $A = \left[M_{2A}/M_{pol}\right] \cdot 100$; $M_{pol} = \left[M_{2A}/A\right] \cdot 100$ The authors determined the molecular weights of chelate polymers produced formerly:

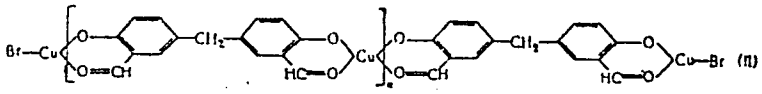
Card 2/7

Determination of the molecular ...

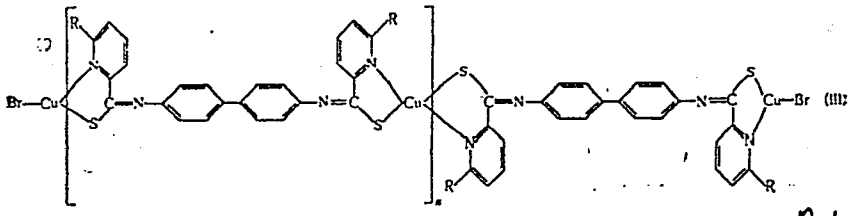


(I)

где R = 2H —, — $(CH_2)_2$— , — $(CH_2)_6$ — и о-C_6H_4 —



(II)



(III)

№ 1.

где R = H — и CH_3 —.

Card 3/7

Determination of the molecular ...

All these polymers were synthesized with cupric bromide tagged with Br^{82}. Table 1 shows the molecular weights determined, and the polymerization coefficients of the chelate polymers calculated on the basis of Eq. (2). The percentage of the anion (A) was calculated to be the ratio between the portion of the Br^{82} activity in the precipitate and the activity introduced. The molecular weights are 3-4 times higher than those obtained by other scientists. The authors explain the lower molecular weight of (III) by the different stability of the chelate node, in the macrochain. In polymer (I) the molecular weight changes according to R. The authors proved this to depend upon the different oxidizabilities of the amines participating in the reaction. The higher the oxidizability of an amine, the faster the rupture of the chain and the lower the molecular weight of the polymer. Since amines also oxidize when left standing in solutions, the molecular weight of a polychelate decreases due to a longer period between the preparation of the solution of an easily oxidizable amine and its application. Such amines in this case were: hexamethylene diamine ((I)R = $-(CH_2)_6-$) and o-phenylene diamine ((I)R = $o\text{-}C_6H_4-$). The reaction with a newly prepared solution yielded the highest molecular weights.

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Determination of the molecular ...

When left standing for 3-5 hr, the molecular weight of the polymers was only 50% (in agreement with Ref.1). When left standing for 48 hr and more, low-molecular compounds are formed. With other structures ((I)R = 2H—; (I)R = —$(CH_2)_2$—) the molecular weights remain constant even after 48 hr.

Polymers (I) may be produced by the method of nascent reagents and also from polymeric Schiff's bases. The average molecular weight is not affected by the method of synthesis. The authors reproduced their methods of determination with a monomer of analogous structure, namely copper salicylal ethylene diamine, to examine whether bromine anions are bound by the polymer surface. The actual molecular weights of polychelates would thus seem to be too low. The authors found that the copper complex, corresponding to theory, in fact does not contain radioactive bromine, i.e., binding did not take place. The method of determining the molecular weights of the above chelate polymers described by the authors yields stable, reproducible results. There are 2 tables and 9 references: 8 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication is given in the body of the abstract.

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25340
S/020/61/138/006/016/019
B103/B215

Determination of the molecular ...

ASSOCIATION: Moskovskiy gosudarstvenyy universitet im. M. V. Lomonosova
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: February 24, 1961

Card 6/7

31090
S/195/61/002/004/005/008
E111/E585

5.4400

AUTHORS: Keyyer, N.P., Boreskov, G.K., Rode, V.V., Terent'yev, A.P. and Rukhadze, Ye.G.

TITLE: Catalytic activity of organic semiconductors. I. Polychelates

PERIODICAL: Kinetika i kataliz, v.2, no.4, 1961, 509-518

TEXT: The authors investigated various classes of organic polymers in order to establish the catalytic capacity of organic semiconductors and the relationship between their electrical conductivity and catalytic activity. The present work deals with polychelates of a given structure whose electrical conductivity varies by more than ten orders, depending on chemical composition. As regards chemical composition and structure the polychelates were of two types: 1) the sulphur atoms constitute the electron donor and, together with the metal, form the chelate group, which is connected with the radical by the =N-C group

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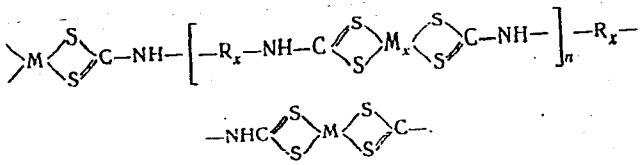
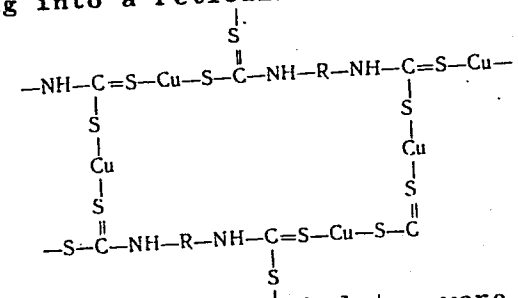
S/195/61/002/004/005/008
E111/E585

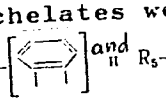
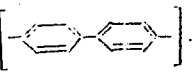
Catalytic activity of ...



2) monovalent copper forms two coordination linear bonds -S-Cu-S- evolving into a reticular structure



The organic radicals of the polychelates were

Card 2/4 R_2—$(CH_2)_2$—; R_3—$(CH_2)_6$—; R_4—  and R_5—  .

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S/195/61/002/005/005/008
E111/E585

Catalytic activity of

The polychelates were synthesized through the interaction of equimolar aqueous solutions of the metal acetates with soda bis-dithiocarbamates $R_x(NHCSSNa)$ the molecular weight of the polychelates was 53×10^3 to 67×10^3. The activity of twelve Ni, Cu, Co, Zn and Cd polychelates was studied in the decomposition reaction of 93% pure hydrazine hydrate at temperatures from 74 to 104°C. The Ni, Cu and Co polychelates displayed the highest catalytic activity, 100 times greater than that of NiO and NiS semiconductor catalysts, the Ni polychelate R_5Ni (type 1) had the highest activity and remained stable even after exposure to air. Zn and Cd polychelates displayed no activity at 104°C. The organic radicals had marked and varied effects on the catalytic activity of the polychelates. The catalytic activity of Ni polychelates was affected most, the highest activity was displayed by Ni polychelates with the organic radical R_5 and by Cu polychelates with R_2; the activity of the Co polychelates was affected only slightly by the organic radical. Although the results do not disclose any relation between the volume electrical conductivity $\delta_{23°}(\text{ohm cm})^{-1}$ and the catalytic activity of the polychelates the

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Catalytic activity of S/195/61/002/004/005/008
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pronounced effect of the organic radical on catalytic activity indicates a dependence of such activity on the electron state of the metal, which is conditioned by the donor groups and the organic radical entering into the composition of the polychelate [illegible] suggested that the electron effect on catalytic activity will be better understood when more is known about the regularities in the change of the surface electrical properties of the polychelates
Acknowledgments are expressed to Z V Zvonkova V M Vozzhennikov and L I Badzhadze for data on the electrical conductivity of the samples and valuable advice. There are two tables 6 figures and 10 Soviet-bloc references

ASSOCIATION: Institut kataliza SO AN SSSR Khimicheskiy fakul tet MGU (Institute of Catalysts SO AS USSR Chemical Faculty MGU)

SUBMITTED May 22 1961

Card 4/4

SOV/156-59-1-33/54

5(3)

AUTHORS: Terent'yev, A. P., Rode, V. V., Volodina, M. A.

TITLE: The Dithiocarbamates of Certain Nitrogenous Heterocyclic Compounds (Ditiokarbamaty nekotorykh azotsoderzhashchikh geterotsiklicheskikh soyedineniy). Intracomplex Copper Dithiocarbamates (Vnutrikomplekhsnyye mednyye ditiokarbamaty)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1959, Nr 1, pp 129 - 133 (USSR)

ABSTRACT: The problem of the structure of the dithiocarbamates is still in dispute. The authors synthesized and investigated several dithiocarbamates of the homologues of pyrrolidine, piperidine, and their derivatives, as well as of the products of their dehydration. Sodium salts are formed only if the nitrogenous heterocyclic compound is saturated. Copper salts, however, were obtained from all of the compounds investigated. The spectra of all the copper compounds produced, as well as the spectra of certain sodium compounds were photographed. In the sodium compounds, both spectrum and numerous properties point to an ion structure. The resulting sodium salts of the

Card 1/4

The Dithiocarbamates of Certain Nitrogenous Heterocyclic Compounds. Intracomplex Copper Dithiocarbamates SOV/156-59-1-33/54

dithiocarbamic acid of saturated heterocyclic compounds are white crystalline substances that solve well in water and alcohol, but are insoluble in organic solvents such as ether, benzene, chloroform, carbon tetrachloride, and ethyl acetate. Sodium dithiocarbamates were obtained from : 2-methyl-pyrrolidine, 2,5-dimethyl-pyrrolidine, 2,2-pentamethylene-pyrrolidine, piperidine, 3,3-dimethyl-2-isopropyl-piperidine, 3,4-diphenyl-piperidine. (The spectral absorption maxima, decomposition temperatures, and yields are presented in tables and diagrams). All of the copper compounds are water-insoluble, difficultly soluble in alcohol, but solve well in the above-mentioned organic solvents. They are blackish-brown, as are their solutions in the organic solvents, the solutions being occasionally even more intensively colored. The copper dithiocarbamates show good stability. They were not affected by acetic or hydrochloric acids. Nitric acid decomposes them after prolonged standing or on heating. The spectra of the copper compounds show certain governing rules according to the individual ring substituents. The double bonds in the nitrogenous heterocyclic ring are also spectrally

Card 2/4

The Dithiocarbamates of Certain Nitrogenous Heterocyclic Compounds. Intracomplex Copper Dithiocarbamates SOV/156-59-1-33/34

characterized. Copper dithio-carbamates were obtained from : 2-methyl-pyrrolidine, 2,5-dimethyl-pyrrolidine, 2,2-pentamethylene-pyrrolidine, piperidine, 3,3-dimethyl-2-isopropyl-piperidine, 3,4-diphenyl-piperidine, 2-methyl-Δ^2-pyrroline, 2,5-dimethyl-Δ^2-pyrroline, 2,3,5-trimethyl-Δ^2-pyrroline, 3,3-dimethyl-2-isopropyl-Δ^4-pyrroline, pyrrole, 2-methyl-pyrrole, 2,4-dimethyl-pyrrole, 2,4-dimethyl-3,5-dicarbethoxy-pyrrole. (Absorption maxima, decomposition temperatures, copper content, and yields are presented in tables and diagrams). As the spectral absorption maxima are situated at 420 - 440 mμ, one will have to conclude to an intracomplex structure. There are 2 figures, 2 tables, and 20 references, 4 of which are Soviet.

Card 3/4

The Dithiocarbamates of Certain Nitrogenous Heterocyclic SOV/156-59-1-33/54
Compounds. Intracomplex Copper Dithiocarbamates

ASSOCIATION: Kafedra organicheskoy khimii Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Chair of Organic Chemistry of Moscow State University imeni M. V. Lomonosov)

SUBMITTED: June 16, 1958

Card 4/4

5(3) SOV/79-29-7-11/83

AUTHORS: Gladshteyn, B. M., Rode, V. V., Soborovskiy, L. Z.

TITLE: Synthesis of Fluorotrialkyl Germane Compounds
(Sintez ftoristykh trialkilgermanov)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 7, pp 2155-2156 (USSR)

ABSTRACT: In the present paper the synthesis of a fluorotrialkyl germane compound was carried out by the direct action of hydrogen fluoride on the tetraalkyl germane compound: $GeR_4 + HF \longrightarrow R_3GeF + RH$, where $R = CH_3$ and C_2H_5. This reaction takes place smoothly and produces a quantitative yield of monofluorotrialkyl germane. It is possible that this reaction may be used for the elaboration of a quantitative method of determining some tetraalkyl germanes. The replacement of an alkyl group by fluorine in tetraalkyl germane becomes distinctly manifest in the properties of the remaining Ge - C bonds. The further action of HF on fluorotrialkyl germanes, even under more rigid conditions, does not lead to a separation of other alkyl groups. In this way fluorotrialkyl germanes are obtained in pure state, without admixtures of di- and trifluoroalkyl germanes.

Card 1/2

For this reason the method is comfortable and preparative. The values of the increments of the atomic refractions of germanium for fluorotrimethyl- and fluorotriethyl germanes slightly vary between 8,35 and 8,28. The initial tetraalkyl germanes are obtained by organomagnesium synthesis from germanium tetrachloride and the corresponding alkyl magnesium halide, which under the present conditions (in dibutyl ether medium) led to a quantitative yield. Earlier, this ether was used for the synthesis of tetraalkyl germanes, their yield, however, was only low (Ref 5). There are 7 references, 1 of which is Soviet.

SUBMITTED: June 17, 1958

TERENT'YEV, A.P.; RODE, V.V.; VOLODINA, M.A.

Dithiocarbamates of some nitrogen-containing heterocyclic compounds. Inner complex copper dithiocarbamates. Nauch.dokl. vys.shkoly; khim.i khim.tekh. no.1:129-133 '59.
(MIRA 12:5)

1. Predstavlena kafedroy organicheskoy khimii Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova.
(Copper compounds)

88541

5.3700 1282, 1153, 1164

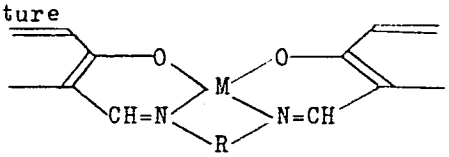
S/190/60/002/010/016/026
B004/B054

AUTHORS: Terent'yev, A. P., Rode, V. V., and Rukhadze, Ye. G.

TITLE: Investigations in the Series of Chelate Polymers. I. Synthesis of Chelate Polymers on the Basis of 5,5'-Methylene Bis-salicyl-aldehyde

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 10, pp. 1557-1563

TEXT: The authors report on the synthesis of chelate polymers of the general structure



R = 2H, $-(CH_2)_2-$, $-(CH_2)_6-$, and $o-C_6H_4=$. Schiff's bases of 5,5'-methylene bis-salicyl-aldehyde and ammonia, ethylene diamine, hexamethylene diamine, and o-phenylene diamine were used as initial substances. A total of 23 chelate compounds were synthesized from the polymers of these Schiff's

Card 1/2

88541

Investigations in the Series of Chelate Polymers. I. Synthesis of Chelate Polymers on the Basis of 5,5'-Methylene Bis-salicyl-aldehyde

S/190/60/002/010/016/026
B004/B054

bases with salts of Zn^{2+}, Cu^{2+}, Ni^{2+}, Co^{2+}, Fe^{2+}, Cd^{2+}; the analyses of these compounds are given in a table. In the experimental part in which V. S. Shmarlin cooperated, the authors report on an improvement of the synthesis of 5,5'-methylene bis-salicyl-aldehyde. They obtained a yield of 47-53% from salicyl-aldehyde and formalin, a yield of 65% with α-polyoxymethylene, and a yield of 75% with paraform. The authors describe the syntheses of poly-5,5'-methylene bis-salicylal ethylene diamine, poly-5,5'-methylene bis-salicylal hexamethylene diimine, and poly-5,5'-methylene bis-salicylal-o-phenylene diimine, as well as the synthesis of the chelate polymers. All compounds were synthesized for the first time, except the o-phenylene diimine compound. There are 1 table and 28 references: 12 Soviet, 12 US, 3 German, and 1 Italian.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: May 5, 1960

Card 2/2

TERENT'YEV, A. P.; RODE, V. V.; RUKHADZE, Ye. G.

Studies in the series of chelate polymers. Part 1: Polymers based on 5,5'-methylene-*bis*-salicylaldehyde. Vysokom. soed. 2 no.10:1557-1563 O '60. (MIRA 13:9)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
(Salicylaldehyde) (Chelates)

KEYYER, N.P.; BORESKOV, G.K.; RODE, V.V.; TERENT'YEV, A.P.; RUKHADZE, Ye.G.

Catalytic activity of organic semiconductors. Part 1: Chelate polymers. Kin.i kat. 2 no.4:509-518 Jl-Ag '61. (MIRA 14:10)

1. Institut kataliza Sibirskogo otdeleniya AN SSSR i Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta.
(Chelates) (Catalysis)

TERENT'YEV, A.P.; R[illegible]HADZE, Ye.G.; MOCHALINA, I.G.; RODE, V.V.

Synthesis of 2,6-diacetylpyridine. Zhur.VKHO 6 no.1:116-117 '61. (MIRA 14:3)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
(Pyridine)

29120
S/020/61/140/005/016/022
B103/B110

15.8540

AUTHORS: Terent'yev, A. P., Corresponding Member AS USSR, Rode, V. V., Rukhadze, Ye. G., Vozzhennikov, V. M., Zvonkova, Z. V., and Badzhadze, L. I.

TITLE: Electrical conductivity of chelate polymers

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 5, 1961, 1093-1095

TEXT: The authors measured the electrical conductivity σ and the activation energy E of several chelate polymers to determine the dependence between their semiconductor properties and their atomic structure. These polymers were mostly synthesized by interaction of equimolecular aqueous solutions of metal acetates and alcoholic solutions of the corresponding tetrafunctional organic compounds. The substances obtained were amorphous, insoluble, and infusible. Their decomposition temperatures were above 250-350°C. More data will be published in the coming issues of the periodical "Vysokomolekulyarnyye soyedineniya". For measuring the electrical conductivity samples in tablet form were used: diameter 5-7 mm,

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29120
S/020/61/140/005/016/022
B103/B110

Electrical conductivity of ...

σ = up to 10^{-13} $ohm^{-1} \cdot cm^{-1}$. It changes with the temperature according to the exponential function $\sigma = \sigma_o \exp(-E/2kT)$. The results are given in Table 1. Copper-polychelates of structure I had the highest electrical conductivity. Their special electrical properties are in good agreement with the hypothesis on their network structure. The atoms of monovalent copper form linear bonds: S - Cu - S. X-ray studies showed that the distance between the Cu atoms next to each other -Cu-S=Ċ-S-Cu- equals 5.8 Å. Radicals with π bonds of carbon increase the electrical conductivity of copper polymers. Coplanarity of the polymer chains necessary for the conjugation of the π bonds of the N-C(S)=S atoms and phenylene rings is due to the network structure. In polymers with structure II, σ decreases whereas E increases in the sequence Co, Zn, Ni. The four sulfur atoms are in the same plane as the metal atoms and the N-C(S)=S bonds. The Co-S bonds are tetrahedral. The electrical characteristics of 48 semiconductor

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29120
S/020/61/140/005/016/022
B103/B110

Electrical conductivity of ...

polymers like those of inorganic semiconductors, widely depended on the short range order. There are 1 table and 9 references: 8 Soviet and 1 non-Soviet. The reference to English-language publication reads as follows: B. Long, P. Markey, P. G. Wheatley, Acta crystallogr., 7, 140 (1954).

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)
Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physico-chemical Institute imeni L. Ya. Karpov)

SUBMITTED: May 31, 1961

Table 1. Electrical conductivity of chelate polymers.

Legend: (1) σ_{295} ($ohm^{-1}.cm^{-1}$); (2) same units as (1); (3) in ev; (4) for polychelates: of Ni with R = $-(CH_2)_6-$ and n,n'-$(C_6H_4)_2-$; (5) of zinc; (6) of cobalt; (7) for cadmium polychelates; (8) for all polychelates;

Card 3/6

32342
S/190/62/004/001/003/020
B101/B110

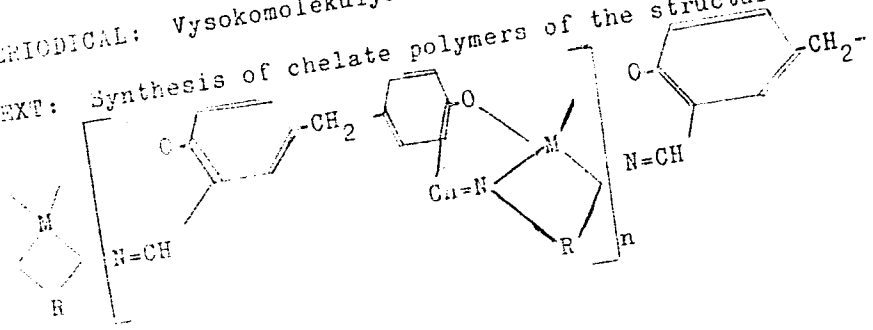
5.3750

AUTHORS: Rode, V. V., Nekrasov, L. I., Terent'yev, A. P., Rukhadze, Ye. G.

TITLE: Studies in the series of chelate polymers. II. Some physicochemical properties of chelate polymers on the basis of 5,5' - methylene-bissalicylic aldehyde

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 1, 1962, 13-19

TEXT: Synthesis of chelate polymers of the structure



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32342
S/190/62/004/001/003/020
B101/B110

Studies in the series of ...

(1), R = 2H-; $-(CH_2)_2-$;
$-(CH_2)_6-$; or $o-C_6H_4-$;
M = Cu^{2+}; Ni^{2+}; Fe^{2+};
Zn^{2+}; Co^{2+}; Cd^{2+};

was described in Vysokomolek. soyed., 2, 1557, 1960. Now their physicochemical properties are reported. All chelates are colored, finely dispersed, insoluble powders. Debye patterns showed that they were amorphous. Thermostability was examined by heating in air and measuring of the loss in weight by a continuous Bc-HB-20 (VR-NV-20) balance. An intensive destruction took place between 260 and 310°C. Prior to decomposition temperature, loss in weight amounted to 2.5 - 6%. Stability decreased depending on the respective substituent in the sequence R = 2H > $o-C_6H_4$ > $-(CH_2)_2-$ > $-(CH_2)_6-$. Sequence $Ni^{2+} > Cd^{2+} > Cu^{2+} > Zn^{2+} > Co^{2+} > Fe^{2+}$ was obtained depending on the metal used. The reflection

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Studies in the series of ...

spectra of chelates were recorded. Absorption maxima (reflection minima) were close to the values for the corresponding monomers. Luminescence (in a decreasing sequence) was observed in compounds with Zn, Cd, Ni, Co, and Cu. Fe compounds did not luminesce. According to Faraday, magnetic susceptibility was determined at 7000 oe by a torsion balance. Zn and Cd chelates proved to be diamagnetic; Cu, Fe, and Co chelates were paramagnetic, those of nickel with R = 2H- and $-(CH_2)_6-$ were paramagnetic while chelates with R = $-(CH_2)_2-$ and o-C_6H_4- were diamagnetic. χ_M for Zn was -123.1 with R = 2H-, and -153.1 with R = $-(CH_2)_2-$; -169.3 ($-(CH_2)_6-$), -194.1 (o-C_6H_4-). The values for Cd are as follows: -160.2 ($-(CH_2)_2-$); -200.7 ($-(CH_2)_6-$), and -220.0 (o-C_6H_4-); for Ni: -158.4 ($-(CH_2)_2-$), and -178.2 (o-C_6H_4-). Magnetic moments of the paramagnetic compounds expressed in μ_B have the following values: for Ni 2.51, with R = 2H-; 3.47 with $-(CH_2)_6-$; for Cu, 1.79 with 2H-; 1.62 with $-(CH_2)_2-$, 1.43 with

Card 3/5

Studies in the series of ...

$-(CH_2)_6-$, and 1.45 with $o-C_6H_4-$; for Fe (in the same sequence of substituents) 5.32, 3.66, 5.09, 3.72; for Co: 4.01, 4.13, 5.25, and 4.23. A plane configuration of nodes is assumed for diamagnetic Ni chelates and a tetrahedral one for paramagnetic chelates. In the presence of the first and third substituents, Fe forms a tetrahedral, in the presence of the two other substituents, however, it forms a plane configuration. The Co chelate with $R = -(CH_2)_6-$ is tetrahedral. μ_B values of the other Co compounds indicate a combination of plane and tetrahedral nodes. An epr resonance was observed in Cu compounds only. The g factor decreased parallel to the μ_B value. N. I. Kobozev and V. B. Golubev are thanked for discussion. There are 3 figures, 6 tables, and 4 references: 3 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: A. E. Martell, M. Calvin, Chemistry of the metal chelate compounds, New York, 1953.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova

32342
S/190/62/004/001/003/020
B101/B110

Studies in the series of ...

(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: January 12, 1961

Card 5/5

32351
S/190/62/004/001/013/020
B110/B101

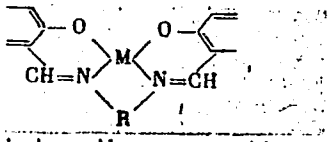
5.3950

AUTHORS: Terent'yev, A. P., Rode, V. V., Rukhadze, Ye. G.

TITLE: Studies in the series of chelate polymers. III. Some polymers of 5,5'-methylene-bis-salicylic aldehyde with metals

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 1, 1962, 91 - 94

TEXT: In preceding papers (Vysokomolek. soyed., 2, 1557, 1960, ibid., 4, 13, 1961) the authors had stated that metals with polymers form bis-(aza-oxa)-polychelates having the following chelate link (2(O, N)-M): ...



(I).

For examining the properties of polymers with 2(O, O)-M links, bis-dioxa-polychelates ...

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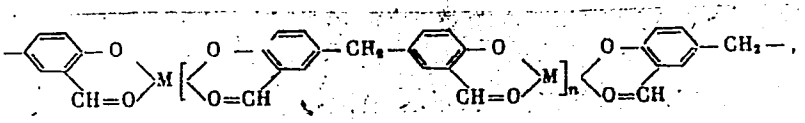
Studies in the series of ...



(II)

were used, where M = Cu^{2+}, Ni^{2+}, Fe^{2+}, and Co^{2+}. Equimolecular quantities of an alcoholic solution of 5,5'-methylene-bis-salicylic aldehyde with aqueous solutions of metal acetates polymerized at room temperature. The polymers unsoluble in alcohol, acetone, ether, dimethyl formamide, and tetrahydrofuran were washed out with water and alcohol, and thus freed from non-reacted metal and aldehyde. After vacuum drying, they represent fine-disperse, colored powders the Debye patterns of which showed amorphism. The unmeltable polymers decomposed at > 250°C. The curves of heat resistance obtained by photographic recording of the losses in weight by means of the recording balance BP-HB-20 (VR-NV-20) showed an intensive destruction at 260 - 300°C (losses in weight at decomposition temperature = 4 - 6%). At 350 - 400°C, quantitative formation of metal oxide takes place. As to heat resistance of bis-dioxa-polychelates, the order

Studies in the series of ...

$Ni^{2+} > Cu^{2+} > Co^{2+} > Fe^{2+}$ was found. In this respect, the polymers produced correspond to those with 2(N, O)-M links. The reflection spectra showed maxima close to the maxima of the monomers and the 2(N, O)-M chelates. The Ni^{2+} and Co^{2+} chelates of structure II showed weak luminescence. The magnetic moments, μ_B, determined at 7000 oersteds were 1.72 for compounds of Cu^{2+}, 2.80 for Ni^{2+}, 4.79 for Fe^{2+}, 3.84 for Co^{2+}. The paramagnetism of poly-5,5'-methylene-bis-salicylic aldehyde of Ni is due to the presence of two unpaired electrons in the nickel ion and, thus, to the tetrahedral structure of the chelate link. The μ_B value of the Fe compound corresponds to four unpaired electrons in the Fe ion and, thus, also to tetrahedral structure. The magnetic moment of Co polychelate, somewhat lower as compared to the tetrahedral cobalt complexes, is probably due to the simultaneous presence of planar chelate links. The magnetic moment of the Cu compound corresponds to an unpaired electron. Electron paramagnetic resonance could be only found in the Cu compound: width of peak = 210.0 oersteds, number of paramagnetic particles per

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32351
S/190/62/004/001/013/020
B110/B101

Studies in the series of ...

$\gamma = 2.71 \cdot 10^{21}$, γ factor = 2.117. There are 2 figures, 2 tables, and 3 references: 2 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: A. E. Martell, M. Calvin, Chemistry of the metal chelate compounds, N. Y., 1953.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: February 1, 1961

Card 4/4

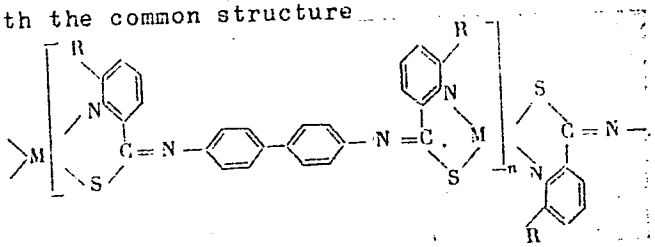
S/190/62/004/004/012/019
B117/B138

AUTHORS: Terent'yev, A. P., Rukhadze, Ye. G., Rode, V. V., Panova, G. V.

TITLE: Investigations in chelate polymers. IV. Polymers of 4,4'-bis-(α-thioalkylpyridineamido)diphenylene with metals

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, o. 4, 1962, 566-570

TEXT: Polymers with the common structure



R = H- and CH_3-; M = Cu^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+} were studied. For these com-

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Investigations in chelate polymers...

pounds, the chelate node of which can be written as 2(N,S)-M, the designation bis-(azathia) polychelate was proposed. From 4,4'-bis(α-thiopicolineamido)diphenyl ($C_{24}H_{18}N_4S_2$, needle-shaped orange crystals, melting point 238°C, yield 53%) and 4,4'-bis-(γ-thio-2,6-lutidineamido)diphenyl ($C_{26}H_{22}N_4H_2$, orange red crystals, melting point 223°C, yield 23%, described for the first time), polychelate polymers were produced having qualitative yield with bivalent metals at room temperature. Using Debye-Scherrer photographs, the structure of these finely dispersed colored powders was found to be amorphous. Investigation of the heat resistance of bis-(azathia)polychelates showed that their decomposition sets in at about 200°C. Total destruction under formation of metal oxides, however, began only after 3 hr heating at 800-1000°C. Nickel and zinc polychelates proved to be more heat-resistant than polymers with copper and cobalt ions. Polychelates with the structure mentioned are also chemically stable. Investigation of their spectra showed that the absorption maxima of bis-(azathia)polychelates are somewhat displaced towards the long-wave range as compared with bis-(azaoxa)- and bis-disoxapolychelates, and that only polymers with zinc ions show weak luminescence. Magnetochemical investigations gave some information on the

Card 2/3

Investigationsin chelate polymers...

structure of chelate nodes of the polymers produced. Polychelates with zinc content and those without unpaired electrons in the molecule proved to be diamagnetic as expected. Purity and structure of these polymers were confirmed by means of experimentally determined molar magnetic susceptibilities and those calculated from Pascal constants. For polymers with unpaired electrons in the molecule (Ni-, Co-, Cu polychelates), tetrahedral structure of the chelate node was assumed in agreement with published data. There are 2 figures and 2 tables. The two English-language references are: K. V. Martin, J. Amer. Chem. Soc., 80, 233, 1958; A. E. Martell, M. Calvin, Chemistry of the metal chelate compounds, New York, 1955.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: March 16, 1961

Card 3/3

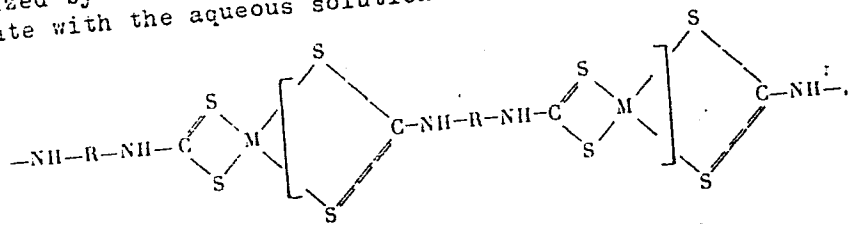
S/190/62/004/006/005/026
B101/B110

AUTHORS: Terent'yev, A. P., Rukhadze, Ye. G., Rode, V. V.

TITLE: Studies of chelate polymers. V. Chelate polymers of bis-dithiocarbamic acids and metals

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 6, 1962, 821-827

TEXT: Chelate polymers of ethylene, hexamethylene, p-phenylene, and p,p'-diphenylene-bis-dithiocarbamic acids with Ni^{2+}, Zn^{2+}, Co^{2+}, and Cu^{+} were synthesized by mixing the aqueous solution of the sodium bis-dithiocarbamate with the aqueous solution of the metal.acetate. The structure



Card 1/2

TERENT'YEV, A.P.; RODE, V.V.; RUKHADZE, Ye.G.

Chelate polymers. Part 6: Some physicochemical properties of chelate polymers of bis-dithiocarbamic acids with metals. Vysokom.soed. 4 no.7:1005-1010 Jl '62. (MIRA 15:7)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Chelates)
(Carbamic acid)

RODE, V. V.

Dissertation defended for the degree of Candidate of Chemical Sciences at the Institute of Organic Chemistry imeni N. D. Zelinskiy in 1962:

"Investigation of Several Gelatin Polymers."

Vest. Akad. Nauk SSSR. No. 4, Moscow, 1963, pages 119-145

TERENT'YEV, A.P.; RODE, V.V.; RUKHADZE, Ye.G.

Chelate polymers. Part 7: Chelate polymers based on 2,6-diacetylpyridine. Vysokom.soed. 5 no.11:1658-1665 N '63. (MIRA 17:1)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

TERENT'YEV, A.P.; RODE, V.V.; RUKHADZE, Ye.G.

Chelate polymers. Part 8: Some aspects of the structure of chelate polymers. Vysokom.soed. 5 no.11:1666-1670 N '63. (MIRA 17:1)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

RODE, V.V., kand.khim.nauk

Aging and the stabilization of polymers. Priroda 52 no.10: 57-61 '63. (MIRA 16:12)

1. Institut elementoorganicheskikh soyedineniy AN SSSR, Moskva.

RODE, V.V.; RUKHADZE, Ye.G.; TERENT'YEV, A.P.

Chelate polymers. Usp.khim 32 no.12:1488-1524 D '63. (MIRA 17:2)

1. Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta imeni Lomonosova.

RAFIKOV, S.R.; CHELNOKOVA, G.N.; RODE, V.V.; ZHURAVLEVA, I.V.; SOROKINA, R.A.

Chemical transformations of polymers. Part 15: Specific features of the thermal degradation of polyenanthamide. Vysokom. soed. 6 no.4:652-654 Ap '64. (MIRA 17:6)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

L 21210-65 EWG(j)/EWT(m)/EWP(j)/EWA(h)/EWA(1) Pc-4/Peb/Pi-4 SSD(c)/
AFTC(a)/ESD(gs)/ESD(t) WH/RM

ACCESSION NR: AP5001481 S/0190/64/006/012/2168/2173

AUTHOR: Rode, V. V.; Yarov, A. S.; Rafikov, S. R.

TITLE: Chemical transformations of polymers 20. The photochemical decomposition of selected polyarylates

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 6, no. 12, 1964, 2168-2173

TOPIC TAGS: polyester stability, polyarylate stability, polymer film, thermal stability, ultraviolet irradiation, photochemical decomposition, phenolphthalein polycondensation, terephthalic acid, isophthalic acid, infrared spectrum, polymer crosslinking, chain transfer

ABSTRACT: Polyesters of high thermal stability, prepared by polycondensation of phenolphthalein with terephthalic or isophthalic acid by the method of V. V. Korshak et al., were studied for their stability in a vacuum under ultraviolet light. Thin films were deposited from chloroform solution, dried, exposed for up to 120 hrs. to the light of a mercury vapor lamp (6.3 quanta/sec·cm^2), and analyzed by infrared spectroscopy. The gaseous products were identified as carbon monoxide and dioxide by gas chromatographic analysis. The coloration of the films increased and both tensile strength and relative elongation decreased with increasing irradiation time, but decomposition as indicated by the studied parameters was

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L 21210-65
ACCESSION NR: AP5001481

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shown to take place primarily during the first 50-60 hrs. of irradiation. A mechanism for crosslinking, chain transfer, and chain termination by photochemical reactions is proposed, and crosslinking was shown to be favored by the cleavage of lactone rings in the studied polymers. The decrease in decomposition rates with irradiation time was related to the formation of quinoid compounds and their stabilizing activity." The authors thank V. V. Korshak, S. V. Vinogradova and S. N. Salazkin for supplying the specimens." Orig. art. has: 3 tables, 5 figures and 1 formula.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute for Heteroorganic Compounds, AN SSSR)

SUBMITTED: 19Feb64 ENCL: 00 SUB CODE: MT

NO REF SOV: 006 OTHER: 005

Card 2/2

RODE, V.V.; ZHURAVLEVA, I.V.

Recording instrument for continuous weighing. Zav.lab. 30 no.12:1518-1519 '64. (MIRA 18:1)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

L 38624-65 EWT(m)/EPF(c)/EPR/EWP(j)/T Pc-4/Pr-4/Ps-4 WW/RM

ACCESSION NR: AP5008105 S/0062/65/000/002/0269/0275

AUTHOR: Zhuravleva, I. V.; Rode, V. V.; Rafikov, S. R.

TITLE: Chemical reactions of polymers. Report No. 19. Thermal degradation of polyarylates synthesized from phenolphthalein and terephthalic or isophthalic acid

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 2, 1965, 269-275

TOPIC TAGS: thermal degradation, polymer degradation, polyarylate degradation, phenolphthalein polymer, terephthalate polymer, isophthalate polymer, heterochain polyester

ABSTRACT: The purpose of this work was to establish the composition and relative proportions of the degradation products of polyarylates which were heterochain polyesters of phenolphthalein and isophthalic acid (F-1) or terephthalic acid (F-2), and to determine the probable mechanism of the degradation. The low-molecular products were separated by chromatography on aluminum oxide. The infusible solid degradation product consists of a carbonized three-dimensional skeleton similar to some types of bituminous coals; the low-molecular products include biphenyl, triphenyl-methane, benzoic acid, and traces of phenol and phenolphtha-

Card 1/2

L 38624-65
ACCESSION NR: AP5008105

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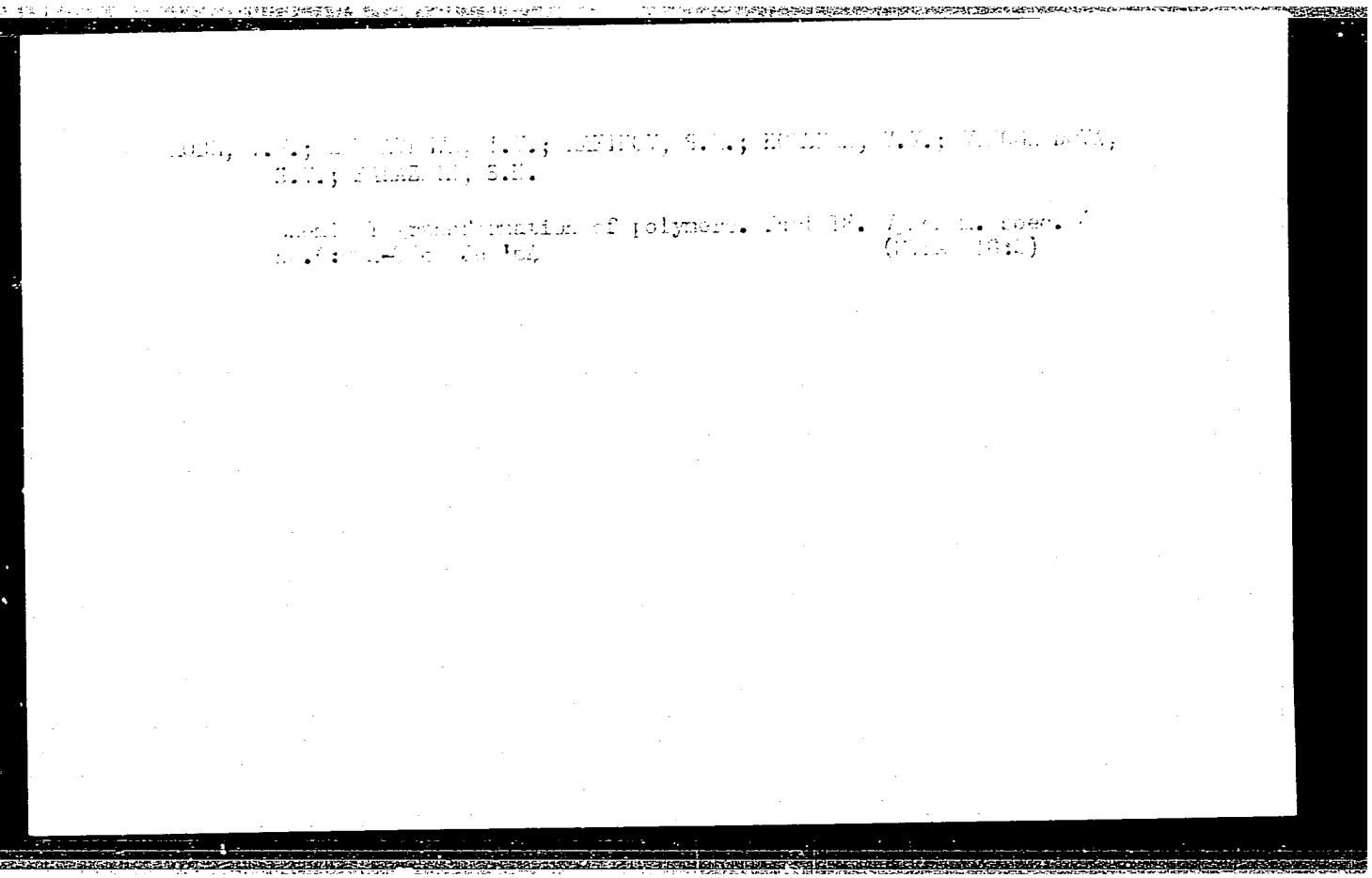
lein; the only gaseous degradation products are carbon dioxide and monoxide. From a kinetic analysis of the evolution of gas it was concluded that the process occurs as a parallel-consecutive reaction. The theoretically calculated rate constants of the steps of these parallel-consecutive reactions are in good agreement with the experimental data. The effective activation energies of the degradation processes were determined. An interpretation of the mechanism of the process is given. "The authors thank V. V. Korshak, S. V. Vinogradova, and S. N. Salazkin for supplying the polymer samples." Orig. art. has: 6 figures, 5 tables, and 4 formulas.

ASSOCIATION: Institut elementoorganicheskikh soyedinenii Akademii nauk SSSR (Institute of Organometallic Compounds, Academy of Sciences, SSSR)

SUBMITTED: 14Feb64 ENCL: 00 SUB CODE: OC

NO REF SOV: 007 OTHER: 001

Card 2/2



BARINOV, I.V.; RODE, V.V.; RAFIKOV, S.R.

Synthesis of pyrocatechol phosphite. Izv. AN SSSR Ser. khim. no.11: 2115 N '64 (MIRA 18:1)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

RODE, V.V.; RAFIKOV, S.R.; YERGEBEKOV, M.Ye.; D'YACHKOV, G.A.; VASKEVICH, D.N.; KONOVALOV, P.G.

Thermal and oxidative degradation of polyalkylenephosphinic acids and their salts. Vysokom. soed. 7 no.5:928-932 My '65. (MIRA 18:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

RODE, V.V.; ZHURAVLEVA, I.V.; RAFIKOV, S.R.; KORSHAK, V.V.; VINOGRADOVA, S.V.; PANKRATOV, V.A.

High temperature degradation of polydihydroxydiphenylfluorene teraphthalate. Vysokom. soed. 7 no.9:1614-1618 S '65. (MIRA 18:10)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

ZHURAVLEVA, I.V.; RODE, V.V.; RAFIKOV, S.R.

Thermodynamic parameter of polyarylate - tetrachloroethane interaction. Vysokom.soed. 7 no.7:1270-1272 Jl '65. (MIRA 18:8)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

RODE, V.V.; RAFIKOV, S.R.; YERGEBEKOV, M.Ye.; VASKEVICH, D.N.; KONOVALOV, P.G.; D'YACHKOV, G.A.

Thermal degradation of polyalkylenephosphinic acids and their salts. Vysokom. soed. 7 no.8:1452-1455 Ag '65. (MIRA 18:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

ZHURAVLEVA, I.V.; RODE, V.V.; RAFIKOV, S.R.

Chemical transformations of polymers. Report No.19: Thermal degradation of polyarylates based on phenolphthalein with terephthalic and isophthalic acids. Izv. AN SSSR Ser. khim. no.2:269-275 '65. (MIRA 18:2)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

ZHURAVLEVA, I.V.; RODE, V.V.; RAFIKOV, S.R.

Formation of three-dimensional lattices in the thermal and thermal oxidizing aging of polyarylates. Vysokom. soed. 7 no.11:1981-1984 N '65. (MIRA 19:1)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
Submitted December 29, 1964.

L 27303-66 EWT(m)/EWP(j)/T/ETC(m)-6 IJP(c) DS/WW/RM

ACC NR: AP6008983 SOURCE CODE: UR/0190/65/007/011/1981/1984

AUTHORS: Zhuravleva, I. V.; Rode, V. V.; Rafikov, S. R.

ORG: Institute for Heteroorganic Compounds, AN SSSR (Institut elementoorganicheskikh soyedineniy AN SSSR)

TITLE: Formation of three-dimensional lattices in the thermal and thermooxidative aging of polyarylates / Second communication in the series "Aging and Stabilization of Polymers" /

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 11, 1965, 1981-1984

TOPIC TAGS: polymer, polyaryl plastic, polyarylate, thermal aging/ F-2 polyarylate, D-9 polyarylate

ABSTRACT: This investigation was conducted to extend earlier published work by V. V. Rode, I. V. Zhuravleva, S. R. Rafikov, V. V. Korshak, S. V. Vinogradova, and V. A. Pankratov (Vysokomolek. soyed. 7, 1614, 1965) and to study the thermal and thermooxidative aging of F-2 and D-9 polyarylates at low degrees of conversion. The experiments were carried out in the temperature interval of 250--450C. After exposure to the above temperatures for a period of 1--4 hours, the specimens were placed in tetrachloroethane. The soluble fraction of the polymer was subjected to viscosimetric, turbidimetric, light scattering, and molecular weight analysis. For the insoluble fraction, the equilibrium degree of swelling (Q) was ascertained, and the density of

UDC: 678.01:54+678.674

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L 27303-66

ACC NR: AP6008983

cross-linkages in the polymer were determined after T. Orofino and P. Flory (J. Chem. Phys., 26, 1067, 1957). The experimental results are presented in graphs and tables (see Fig. 1).

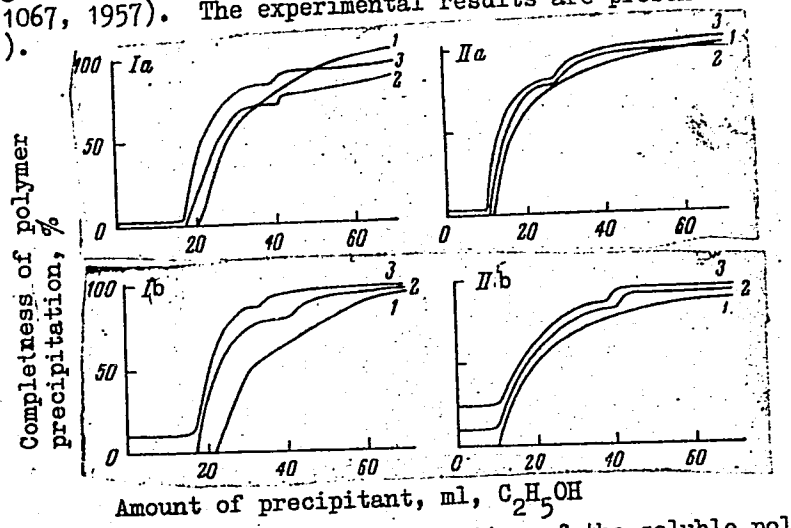

Fig. 1. Curves for the turbidimetric titration of the soluble polyarylate fraction after aging for 1 hour at different temperatures: I - polyarylate F-2; II - polyarylate D-9; a - thermoaging; b - thermooxidative aging; 1 - initial polymer; 2 - 275C; 3 - 300C.

Card 2/3

L 27303-66

ACC NR: AP6008983

It was found that polyarylate F-2 forms a nonswelling gel more rapidly than polyarylate D-9. The molecular weight distribution curve of the soluble polymer fraction first increases and then, upon reaching a maximum, separates into two curves. Orig. art. has: 3 tables, 1 graph, and 5 equations.

SUB CODE: 11/ SUBM DATE: 29Dec64/ ORIG REF: 005/ OTH REF: 001

Card 3/3

L 2925-66 EWT(m)/EPF(c)/EWP(j)/T/ETC(m) WW/RM

ACCESSION NR: AP5022610 UR/0190/65/007/009/1614/1618
678.01:54+678.674

AUTHORS: Rode, V. V.; Zhuravleva, I. V.; Rafikov, S. R.; Korshak, V. V.; Vinogradova, S. V.; Pankratov, V. A.

TITLE: The high temperature degradation of polydihydroxydiphenylfluorentere-phthalate. 24th communication in the series "Chemical Transformation of Polymers"

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 9, 1965, 1614-1618

TOPIC TAGS: thermal degradation, thermal oxidation, organic compound, polymer/D 9 polyarylate

ABSTRACT: The thermal degradation and thermooxidation of polyarylate D-9 was investigated. This investigation is an extension of the previously published work of I. V. Zhuravleva, V. V. Rode, and S. R. Rafikov (Izv. AN SSSR, ser. khim., 1965, 269). The thermal degradation and thermooxidation were carried out over the temperature region from 325 to 500C by 25C intervals. Graphs for the kinetics of gas evolution during degradation and thermooxidation are presented. The composition of the thermooxidation-degradation products are tabulated. The

Card 1/3

L 2925-66

ACCESSION NR: AP5022610 5

experimental results obtained for the thermooxidation in air are shown graphically in Fig. 1 on the Enclosure. It is concluded that the thermooxidation degradation of polyarylate D-9 proceeds via a homolytic chain rupture accompanied by the evolution of CO_2, CO, and H_2 gases. No induction period for the thermooxidation was observed. Orig. art. has: 2 tables and 6 graphs.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute for Heteroorganic Compounds, AN SSSR)

SUBMITTED: 23Oct64 ENCL: 01 SUB CODE: OC

NO REF SOV: 003 OTHER: 000

Card 2/3

L 2925-66

ENCLOSURE: 01

ACCESSION NR: AP5022610

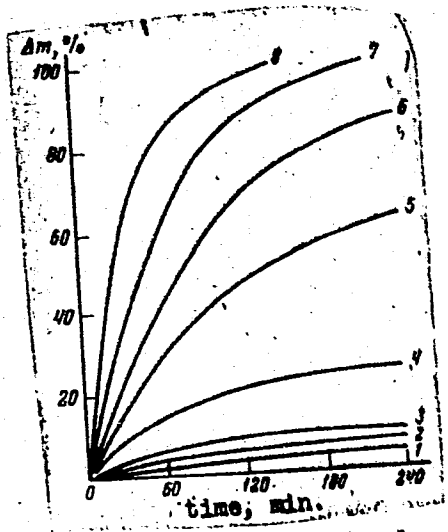

Fig. 1. Kinetics of weight loss of polyarylate D-9 during thermooxidation in air.
1- 325C; 2- 350C; 3- 375C; 4- 400C; 5- 425C;
6- 450C; 7- 475C; 8- 500C

PC

Card 3/3

L 61725-65 EWT(m)/EPF(c)/EWP(j)/T Pc-4/Pr-4/Ps-4 WW/RM

ACCESSION NR: AP5013064 UR/0190/65/007/005/0928/0932
678.01:54+678.86

AUTHORS: Rode, V. V.; Rafikov, S. R.; Yergebekov, M. Ye.; D'yachkov, G. A.; Vaskevich, D. N.; Konovalov, P. G. 37 34 B

TITLE: Thermooxidative degradation of polyalkylenephosphinic acids and their salts. 22nd communication in the series "Chemical transformations in polymers"

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 5, 1965, 928-932

TOPIC TAGS: polymer, thermal degradation, oxidation, polyalkylphosphinic acid, polyethylene

ABSTRACT: The work was undertaken to extend the investigations of polyalkylenephosphinic acids of different phosphorus content (A) and their salts (B), reported by S. R. Rafikov and M. Ye. Yergebekov (Dokl. AN SSSR, 160, 1331, 1965), and, in particular, to determine the thermal stability of these compounds at elevated temperatures. The thermooxidative degradation of the following compounds has been investigated: polyalkylphosphinic acids containing 1.7, 6.5, and 14% P and the Na, Ba, and Pb salts of 14% P acid. The results were compared with thermal degradation data for pure polyethylene. Thermooxidative degradations were carried out in air in

Card 1/2

L 61725-65
ACCESSION NR: AP5013064

3

the temperature interval 200-400C. Overall weight loss, the amount of water liberated, and activation energies are tabulated for compounds investigated and are compared with the corresponding data for polyethylene. It was found that polyalkylphosphinic acids dehydrate at 200-250C and that the Na, Ba, and Pb salts of the 14% P acid decompose above 300C, the order of stability being Pb > Ba > Na. The introduction of 1.7% P into polyethylene greatly enhances its thermal stability. It is concluded that phosphorus-containing polymers are more stable than polyethylene. Orig. art. has: 2 tables and 5 graphs.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy AN SSSR (Institute for Hetero-Organic Compounds, AN SSSR)

SUBMITTED: 25Jul64 ENCL: 00 SUB CODE: OC, GC

NO REF SOV: 007 OTHER: 000

awm
Card 2/2

ACC NR: AP7002938 (A) SOURCE CODE: UR/0020/66/171/006/1352/1354

AUTHOR: Rafikov, S. R. (Academician AN KazSSR); Rode, V. V.; Verkhotin, M. A.; Andrianov, K. A. (Academician)

ORG: Institute of Heteroorganic Compounds, Academy of Sciences SSSR (Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR)

TITLE: Mechanism of thermal stabilization of polydimethylsiloxane by titanium and iron compounds

SOURCE: AN SSSR. Doklady, v. 171, no. 6, 1966, 1352-1354

TOPIC TAGS: lubricant additive, lubricant, silicone lubricant, silicone lubricant thermal stability

ABSTRACT:
A study was made of the mechanism of the effect of small amounts of titanium and iron compounds on the thermal degradation of polydimethylsiloxane (PS) in vacuum under isothermal conditions. The results were compared with previously obtained thermal degradation data on polytitanodimethylsiloxane (PTS) (PS containing Ti atoms in the backbone). The additives tested were tetrabutoxytitanium (BT), dibutoxytitanium bis(acetylacetonate) (AT), iron acetylacetonate (AI), titanium oxides (OT), and iron oxides (OI). The amount of BT, AT, or AT to be added was calculated so there was one equivalent of metal per 62 repeat units of PS, the same ratio as in the PTS.

Card 1/2 UDC: 547'128

ACC NR: AP7002938

BT, AT, and AI were introduced by mixing their solutions in dry benzene with a similar solution of PS, and subsequently evaporating the solvent. OT and OI were introduced by adding a ten-fold excess over theory to concentrated benzene solutions of PS, with subsequent drying and milling. The thermal degradation criteria used were weight loss, intrinsic viscosity of benzene-soluble fraction, amount of gel fraction, and amount of volatiles formed, all at 200—500C for 4 hr. Experimental results are given in graphic form. It was found that the additives have a beneficial effect on thermal stability similar to, but less pronounced than, that of the presence of titanium in the backbone at the onset (PTS). It was concluded that the beneficial effect of metal compounds is due to their reacting with the PS macromolecules in the process of thermal degradation to form a new high-thermal-stability, high-molecular-weight compounds containing metal atoms in the backbone.

Orig. art. has: 3 figures.

SUB CODE: 11/ SUBM DATE: 02Apr66/ ORIG REF: 007/ OTH REF: 003/ ATD PRESS: 5112

Card 2/2

L 41227-66 EWT(m)/EWP(j)/T IJP(c) WW/RM

ACC NR: AP6023430 SOURCE CODE: UR/0190/66/008/007/1226/1230

AUTHOR: Verkhotin, M. A.; Andrianov, K. A.; Zhdanov, A. A.; Kurasheva, N. A.; Rafikov, S. R.; Rode, V. V.

ORG: Institute of Hetero-organic Compounds, AN SSSR (Institut elementoorganicheskikh soyedineniy AN SSSR)

TITLE: Thermal degradation of certain polymetallodimethylsiloxanes

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 8, no. 7, 1966, 1226-1230

TOPIC TAGS: polysiloxane, titanium compound, polymer degradation, organoaluminum compound, depolymerization, elastomer

ABSTRACT: The thermal degradation of polyaluminodimethylsiloxane (PAS) and polytitanodimethylsiloxane (PTS) (see Fig. 1) was studied in a vacuum at various temperatures. The predominant process in the thermal aging of the polymers was found to be depolymerization involving rupture of the Si-O bond and formation of hexamethylcyclotrisiloxane. The depolymerization begins after the gel formation maximum has been reached; at the same time, the aluminum atom in the elastomer chain slightly increases and the titanium atom considerably decreases the depolymerization rate as compared to polydimethylsiloxane. The gel formation maximum in polytitanodimethylsiloxane is shifted by 200° toward higher temperatures as compared to polyaluminodimethylsiloxane. In addition to the depolymerization, a homolytic rupture of Si-C and C-H bonds with the liberation of hydrogen, methane, and ethane takes place during the thermal degra-

Card 1/2 UDC: 678.01:54+678.84

L 41227-66

ACC NR: AP6023430

dation of polyalumino- and polytitanodimethylsiloxane. Orig. art. has: 2 figures and 2 tables.

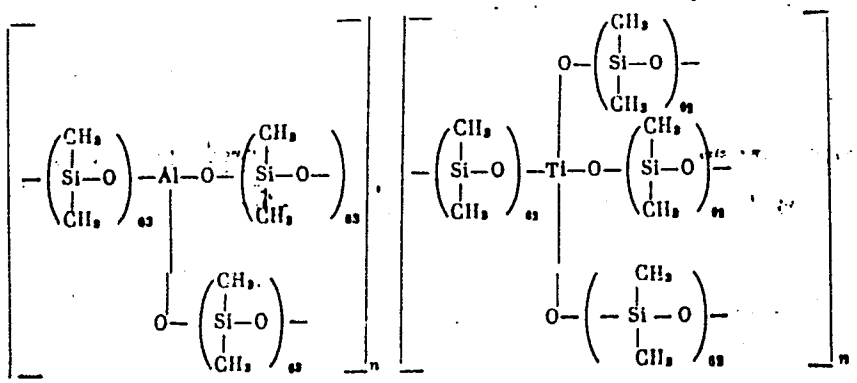

Fig. 1. Formulas of PAS and PTS.

SUB CODE: 07/ SUBM DATE: 16Jun65/ ORIG REF: 007/ OTH REF: 003

Card 2/2 MLP

L 41715-66 EWT(m)/EWP(j)/T IJP(c) WW/RM
ACC NR: AP6019530 (A) SOURCE CODE: UR/0020/66/168/004/0825/0827

AUTHOR: Rode, V. V.; Korshak, V. V. (Corresponding member AN SSSR); Frunze, T. M.; Baranov, Ye. L.; Balykova, T. N.

ORG: Institute of Organoelemental Compounds, Academy of Sciences, SSSR (Institut elementoorganicheskikh soyedineniy akademii nauk SSSR)

TITLE: Thermooxidative destruction of the graft copolymers of styrene with epsilon-caprolactam

SOURCE: AN SSSR. Doklady, v. 168, no. 4, 1966, 825-827

TOPIC TAGS: copolymer, polystyrene, oxidation kinetics, block copolymer, heat resistance, GRAFT COPOLYMER, STYRENE, OXIDATIVE DEGRADATION

ABSTRACT: The kinetics of oxidative degradation of styrene-caprolactam graft copolymers was studied. 0.05 g samples of copolymers containing 10, 20, and 33% styrene were oxidized in an oxygen stream at 300-375°C. It was found that the stability of the styrene-caprolactam copolymers to oxidative degradation increases with increasing content of caprolactam. It was also found that the content of alkaline catalyst in the copolymer has practically no effect on the stability of the styrene-caprolactam copolymer. The kinetic data are graphed and tabulated. Orig. art. has: 2 figures, 2 tables.

SUB CODE: 07/ SUBM DATE: 15Nov65/ ORIG REF: 007/ OTH REF: 003

UDC: 541.66

Card 1/1

L 37093-66 EWP(j)/EWT(m)/T IJP(c) RM/WW

ACC NR: AR6010585 SOURCE CODE: UR/0081/65/000/018/S019/S019

46

B

AUTHOR: Rode, V. V.; Zhuravleva, I. V.; Rafikov, S. R.

TITLE: Thermooxidation of phenolphtalein-based polyarylates.

SOURCE: Ref. zh. Khimiya, Abs. 18S116

REF SOURCE: Vestn. tekhn. i ekon. inform. N.-i. in-t tekhn.-ekon. issled. Gos. kom-ta khim. prom-sti pri Gosplane SSSR, vyp. 12, 1964, 13-14

TOPIC TAGS: thermal decomposition, oxidation kinetics, oilyester plastic

ABSTRACT: The process of thermooxidative destruction of neterochain phenolphtalein polyesters, isophtalic (1) and terephtalic acids (2) at temperatures of 350° to 500° on air and in a closed system under static conditions at an O_2 pressure of 120mm Hg column, is studied by the continuous weighing method. Kinetic curves for (1) and (2) weight loss were plotted. The rate of destruction exponentially depends on the temperature and is presented by an equation of the first order. The effective activation energy of destruction for (1) and (2) is equal 29.2 and 31.5 kkal/mol, respectively. The study of the thermal destruction of (2) in a closed system showed that the sole gaseous products are CO_2 and CO. The thermal destruction of (2)

Card 1/2

L 37093-66

ACC NR: AR6010585

results in the formation beside gases, of solid, low molecular substances (diphenyl, benzoic acid) and high-molecular residue, consisting of products of intermolecular reaction of cross-linked structures. Yu. Yershov.

SUB CODE: 07/ SUBM DATE: none

Card 2/2

RODE, V. YE.

Rode, V. Ye. - "The Kinetics of Superstructure Transformations of the Fe_3Al Alloy." Moscow State U imeni M. V. Lomonosov. Moscow, 1956 (Dissertation for the Degree of Candidate in Physicomathematical Sciences).

So: Knizhnaya Letopis', No. 10, 1956, pp 116-127

RODE, V. E., (Moscow)

"The Kinetics of Order-Disorder Transformations of the Alloy Fe_3Al," a paper submitted at the International Conference on Physics of Magnetic Phenomena, Sverdlovsk, 23-31 May 56.

RODE, V. YE.

48-9-6/26

AUTHOR: Rode, V. Ye.

TITLE: Note on the Kinetics of the Superstructure Transformations of the Fe_3AL Alloy (Kinetika sverkhstrukturnykh prevrashcheniy splava Fe_3AL).

PERIODICAL: Izvestiya AN SSSR Seriya Fizicheskaya, 1957, Vol. 21, Nr 9, pp. 1234-1238 (USSR.).

ABSTRACT: The purpose of this paper was the investigation of the modification of various physical parameters of the Fe_3AL alloy during the process of ordering and parallel with that - the determination of the degree of alloying and ordering respectively from the intensity of the superstructure lines on the X-ray diagrams of the solution. The Kurnakov point was determined for the alloy with the composition in question. For these alloys as well as for such with a surplus of iron and aluminum the temperature dependence of the specific heat C_p, and of the electric resistance ϱ, of the magnetic saturation J_s, and of the linear expansion coefficient α were determined. The curves of dependence on temperature showed two maxima: one corres-

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Note on the Kinetics of the Superstructure Transformations of the Fe_3AL Alloy. 48-9-6/26

ponding to the Kurnakov point, the other to the Curie point. The maxima on the curves for the dependence of the temperature coefficient of electric resistance on the temperature corresponded exactly to the maximum of the curve for specific heat equivalent to the Kurnakov point. Comparing the modification of the lattice parameter, the saturation magnetization and the electric resistance of the alloy with the degree of ordering the following relations were found: The linear dependence of the saturation magnetization on the degree of ordering is given by $\Delta J_s \sim \sigma$ (σ denoting the degree of ordering) and 2) the electric resistance depends on the square of the degree of ordering. $\Delta\rho \sim \sigma^2$.
There are 8 figures and 4 Slavic references.

ASSOCIATION: Faculty for Physics of the Moscow State University imeni M. V. Lomonosow (Fizicheskiy fakultet Moskovskogo gos. universiteta imeni M. V. Lomonosova).

AVAILABLE: Library of Congress.

Card 2/2

VOLKOV, D. I., KONDORSKIY, E. I., KRINCHIK, G. S., MIRYASOV, N. A., PARSANOV, A. P., RODE, V. E., CHECHERNIKOV, V. I. and GOFMAN, U. (Moscow)

"Results of Studied of Certain Magnetic and Magneto-Optical Properties of Ferro-Magnetics:"

1. "Saturation Magnetization of CuNi Alloys at Low Temperatures."
2. "Magnetic Properties of MnB System."
3. "Temperature Dependence of Paramagnetic Susceptibility of Ferrites."
4. "Magneto-Optical Resonance in Ferromagnetics." (Krinchik)

report presented at Colloquim on Magnetism, Grenoble, France, 2-5 Jul 58.

Eval: B - 3,111,755 3 Sep 58.

SOV/56-35-2-54/60

13(6)

AUTHORS: Kondorskiy, Ye. I., Rode, V. Ye., Gofman, U.

TITLE: The Saturation Magnetization of Nickel-Copper Alloys at Low Temperatures (Namagnichennost' nasyshcheniya nikel'-mednykh splavov pri nizkikh temperaturakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 2 (8), pp 549-550 (USSR)

ABSTRACT: The aim of this paper is the verification of the "law of the 3 straight lines" $I = I_o(1 - CT^{3/2})$ for saturation magnetization at low temperatures and the determination of the parameter C in the above-given formula for nickel-copper alloys with a copper content $\leqslant 50$ %. The measuring device permitted immediate observation of the variation of the saturation magnetization of the specimen when its temperature is varied. The temperature variation was carried out by evacuation of the vapors of the boiling liquid (oxygen, nitrogen, hydrogen, and helium) in which the specimen was placed. The variation of the magnetization was measured by means of a photoelectrical fluxmeter. A table shows the values of

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SOV/56-35-2-54/60

The Saturation Magnetization of Nickel-Copper Alloys at Low Temperatures

the magnetization I_o and of nickel-copper alloys in a field of H = 3300 Oersted for various temperatures and also the values of C, calculated according to a formula of Bloch (Blokh). From these values of C it is possible to obtain (in the case of pure metals) the exchange integral J. The results of these calculations are given in a table. The exchange parameter J^* which was calculated in this way remains constant (with an accuracy of 10 - 15 %) for all the investigated nickel-copper alloys. There are 1 table and 3 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet(Moscow State University)

SUBMITTED: May 28, 1958

Card 2/2

69779
S/155/59/000/02/030/036

24.2200

AUTHOR: Rode, V.Ye.

TITLE: Saturation Magnetism of Ferromagnetic Alloys With Curie Temperatures Near 0° K

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1959, No. 2, pp. 158-159

TEXT: The author investigates the saturation magnetism of alloys with a very low Curie point. NiCu with Cu-content of 50-60 atomic per cent was applied as alloy. Graphical representations show the lines of equal magnetization in H, T coordinates, the dependence of the saturation magnetism on the temperature, the dependence of the Curie point on the composition of the alloy. The Curie point decreases nonlinearly for more than 50% Cu and attains 0° K for 62% Cu.
There are 5 figures, and 2 non-Soviet references: 1 German and 1 English.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: April 29, 1959

Card 1/1

S/155/59/000/02/031/036

AUTHORS: Rode, V.Ye., Chzhan Shou - gun

TITLE: The Susceptibility of the Paraprocess of Ferromagnetic Alloys With Low Curie Points

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1959, No. 2, pp. 160-161

TEXT: The authors give a graphical representation of the results of experimental measurements of the susceptibility of the paraprocess of NiCu - alloys with a 55,8 and 58,2% Cu - content and Curie points 35° K and 17° K respectively. The dependence of the susceptibility on the field deviates from that one stated in (Ref. 1).
There are 4 figures, and 3 references : 2 Soviet and 1 German.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: April 29, 1959

Card 1/1

RODE, V.; GOFMAN, U.

Sensivity of nickel - copper alloys in the saturation region.
Nauch.dokl.vys.shkoly; fiz.-mat.nauki no.3:148-150 '59.
(MIRA 13:6)

1. Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
(Nickel-copper alloys)

SOV/51-67-4-7/7

21(0)
AUTHOR: Chentsov, R.

TITLE: The Fifth All-Union Conference on the Physics of Low Temperatures (5-ya Vsesoyuznoye soveshchaniye po fizike nizkikh temperatur)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 67, Nr 4, pp 743-750 (USSR)

ABSTRACT: This Conference took place from October 27 to November 1 at Tbilisi; it was organized by the Otdeleniye fiziko-matematicheskikh nauk Akademii nauk SSSR (Department of Physico-mathematical Sciences of the Academy of Sciences, USSR), the Akademiya nauk Gruzinskoy SSR (Academy of Sciences, Gruzinskaya SSR), and the Tbilisskiy gosudarstvennyy universitet im. Stalina (Tbilisi State University imeni Stalin). The Conference was attended by about 300 specialists from Tbilisi, Moscow, Kharkov, Kiyev, Leningrad, Sverdlovsk, and other cities as well as by a number of young Chinese scientists at present working in the USSR. About 50 lectures were delivered which were divided according to research fields: [illegible] IV. Magnetism:

A. S. Borovik-Romanov (IFP) delivered a report on investigations he carried out of the anisotropy of the weak ferromagnetism in monocrystal samples of the antiferromagnetic $MnCO_3$ (the effect of anisotropy was predicted by the thermodynamical theory developed by Dzyaloshinskiy). In the course of the discussion R. A. Alikhanov (IFP) spoke about neutronographical investigations he carried out of the magnetic structure of $MnCO_3$ and $FeCO_3$ at low temperatures. P. L. Kapitsa stressed the importance of the method based upon Dzyaloshinskiy's theory. M. M. Kreynes (TNIIFRI), whose lecture was read by A. S. Borovik-Romanov, reported on measurements carried out by him (in the IFP) of the magnetic anisotropy of the antiferromagnetic $Cu3O_4$ and $CoSO_4$ monocrystals.

Card 7/11 Ye. A. Turov (IFM AN SSSR, Sverdlovsk) spoke about his theoretical investigations of the magnetizability, the susceptibility, the specific heat, and the resonance frequencies of antiferromagnetics and weak ferromagnetics. A. I. Sudovtsov and Ye. Ye. Semenko (KhPTI) spoke about measurements of the electric resistance of iron in magnetic fields in a wide temperature range with simultaneous plotting of the magnetization curve. M. V. Volkenshteyn, G. V. Fedorov, E. V. Galaynin and M. I. Turchinskaya (IFM AN SSSR) spoke about measurements of magnetization and the Hall effect of polycrystalline samples nickel and Ni-Mn at low temperatures. Ye. I. Kondorskiy,

Card 8/11 V. Bode, U. Gofman and Chang, Sou-chun (MGU) gave a report on susceptibility measurements on nickel and its alloys with copper at low temperatures. [illegible] spoke about the spectrum of the paramagnetic resonance of Tb [illegible] in lattice nitrate at temperatures of liquid hydrogen. M. I. Kaganov and V. M. Tsukernik (KhPTI) dealt with the kinetic phenomena in ferromagnetics at low temperatures and with calculations of relaxation time. A. I. Akhiyezer, V. Baryakhtar and S. Peletminskiy (KhPTI) carried out a theoretical investigation of the relaxation of the magnetic moment in ferrodielectrics. Vlasov (IFM AN SSSR) showed that a linearly polarized elastic (ultrasonic) wave of a frequency of 10^9 cycles when passing through a ferromagnetic substance in the direction of the [illegible] is subjected to a turn of the polarization plane of the order of 10^{-3} - 10^{-4} radian/cm ourselves. [illegible] Kaganov pointed out that in this connection yet another phenomenon may be observed, namely the resonance absorption of ultrasonics if the wavelength is equal to the radius of the Larmor orbit of the electron. [illegible] V. Vaslova Questions.

29984
S/076/61/035/011/004/013
B140/B147

15.2660

AUTHORS: Rode, T. V., and Rode, V. Ye.

TITLE: A study of the magnetic properties of ferromagnetic chromium oxides

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 11, 1961, 2475 - 2479

TEXT: T. V. Rode (Author's abstract of the dissertation, IONKh AN SSSR, 1956) found that not only one, but two structurally different ferromagnetic chromium oxides occur in the system CrO_3 - Cr_2O_3. A detailed study showed the existence of 4 intermediate chromium oxides: Deca-, di-, and monochromate, and one of the general formula CrO_2. CrO_2 has a rutile-type crystal lattice with tri- and hexavalent chromium. It is only formed by thermal decomposition of chromic anhydride or chromium chromate in an autoclave under increased O_2 pressure. Not only CrO_2 but also $Cr_2(CrO_4)_3$ exhibited ferromagnetic properties. The authors studied the magnetic properties of these compounds. The intensity of magnetization was determined

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by the Faraday method. The Curie points of $Cr_2(CrO_4)_3$ and CrO_2 were found at 80°C and 105°C, respectively, from the temperature dependence of the magnetic susceptibility of these substances. This confirms the existence of two chromium oxides of different chemical structure. It was found that the magnetism of $Cr_2(CrO_4)_3$ is not due to the presence of CrO_2. Thermographic and X-ray analysis showed that the amount of CrO_2 contained in the $Cr_2(CrO_4)_3$ is not sufficient to cause the ferromagnetism observed. The magnetic properties of the samples varied with the methods applied for their preparation. Fig.3 represents the magnetization curves as a function of the magnetizing field, and Fig.4 the magnetic saturation as a function of the chemical composition. The course of the latter curve might be due to an uncompensated antiferromagnetism. There are 4 figures, 1 table and 25 references: 5 Soviet and 20 non-Soviet. The three most recent references to English-language publications read as follows: R. Schwarz, I. Fankuchen, R. Ward, J. Amer. Chem. Soc., 74, 1676, 1952; I. Volger, Nature, 170, 1027, 1952; B. Brockhause, J. Chem. Phys., 21, 961,

A study of the magnetic properties ...

1955.

ASSOCIATION: Akademiya nauk SSSR institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Academy of Sciences USSR, Institute of General and Inorganic Chemistry im. N. S. Kurnakov) (Moscow State University imeni M.V.Lomonosov)

Fig. 3. Magnetization curves as a function of the field strength for calcinated samples. (1) (2) $CrO_{2.4}$; (3) $CrO_{2.40}$; (4) $CrO_{2.30}$; (5) $CrO_{2.20}$ (6) $CrO_{1.95}$; (7) $CrO_{1.56}$; (8) $CrO_{1.83}$, obtained by 3 hr calcination of $Cr(OH)_3$ at 325°C in a stream of oxygen; (9) $Cr_2(CrO_4)_3$, obtained by 1 hr calcination of CrO_3 at 390°C. Legend: (a) kilooersted.

Fig. 4. Curve of the magnetic saturation as a function of composition in the range $CrO_{2.40}$ - $CrO_{1.56}$. Legend: (a) atoms O per atom Cr; (b)saturation magnetization in gauss.

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Fig. 3

A study of the magnetic properties ...

Fig. 4

29981
S/076/61/035/011/004/013
B140/B147

RODE, V. YE., VEDYAYEV, A., and KRAYNOV, B.,

"Experimental Determination of Exchange Energies in Ferrites."

report presented at the Symposium on Ferroelectricity and Ferromagnetism, Leningrad, 30 May-5 June 63

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TITLE: Production of strong pulsed magnetic fields of long duration

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ABSTRACT: An assembly is described for obtaining long-duration pulses with rectangular characteristics to produce transient (0.1 sec) magnetic fields of the order of 100 koe. The installation consists of a four-loop LC circuit, each loop containing 17 capacitors and one 400-turn coil, and a trigger circuit. At room temperature 120-koe fields were produced with a duration of 0.06 sec in a volume of 2 cm^3; with solenoids cooled by liquid nitrogen, fields of 200 koe and 0.032 sec were obtained. By eliminating the LC circuit, the same

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